

Andrej Dvornik

Curriculum Vitæ

Research interests

- Weak gravitational lensing
- Large scale structure
- Cosmology
- Dark matter
- Dark energy
- Galaxy–dark matter connection
- Halo model

Experience

10. 2019 – **Post Doctoral Researcher**, *German Centre for Cosmological Lensing, Astronomisches Institut, Ruhr-Universität Bochum*, Bochum, Germany.

9. 2015 – 9. 2019 **PhD Researcher**, *Leiden Observatory, Leiden University*, Leiden, The Netherlands.

- Developed a complete halo model for the galaxy-galaxy lensing pipeline used in the whole KiDS collaboration
- Co-developed a maximum-likelihood galaxy-galaxy lensing software
- Reduced photometric data for the KiDS survey using Astro-WISE pipeline
- Wrote three peer-reviewed articles with further articles in preparation

9. 2015 – 9. 2019 **Teaching Assistant**, *Leiden Observatory, Leiden University*, Leiden, The Netherlands.

- Origin and Evolution of the Universe (Master level) - two semesters (2016–2018)
- Databases and Datamining in Astronomy (Master level) - one semester (2015–2016)
- Co-supervision of master student Bas Zoutendijk (together with Henk Hoekstra) for his Master project (October 2016 – July 2017)
- Co-supervision of master student Steven de Rond (together with Koenraad Kuijken) for his Master project (October 2016 – July 2017)

Academic Service Chair of the group meetings and journal clubs for the gravitational lensing and cosmology research group (October 2015 – August 2017)

Member of the KiDS collaboration

Co-coordinator of the KiDS galaxy-galaxy lensing working group

Referee/reviewer for A&A and MNRAS

Outreach Member of Labod astronomical society (2010–2017)

- Organised astronomical camps for youth (2011–2013)
- Gave public talks and workshops for elementary and high school students on various topics of popular astronomy (2011–2013)
- Organised workshops for high school teachers (2011–2013)

Education

- 2015 – 2019 **PhD**, *Leiden University*, Leiden, The Netherlands.
PhD in Astronomy/Astrophysics
- 2013 – 2015 **MSc**, *Leiden University*, Leiden, The Netherlands.
Master of Science in Astronomy
- 2009 – 2013 **BSc**, *University of Ljubljana*, Ljubljana, Slovenia.
Bachelor of Science in Physics

PhD Thesis

- Title *The Galaxy–Dark Matter Connection: A KiDS Study*
- Supervisors Prof. dr. Koenraad Kuijken
Prof. dr. Henk Hoekstra

MSc Thesis

- Title *Galaxy-galaxy lensing as a probe of the mass distribution on galactic scales*
- Supervisor Prof. dr. Henk Hoekstra
- Co-supervisor Dr. Marcello Cacciato

Honours and awards

- 2013 – 2015 Ad Futura Scholarship (scholarship of Slovenian government for studying abroad)
- 2005 – 2013 Žiga Zois Scholarship for exceptional students

Invited and contributed talks and posters

- January 2019 *Astrodebata seminar*, Ljubljana, Slovenia (*invited talk*)
- November 2018 *KIPAC Tea Talk*, Stanford, CA, USA (*invited talk*)
- November 2018 *CosmoClub*, UC Santa Cruz, CA, USA (*invited talk*)
- November 2018 *INPA seminar*, UC Berkeley, CA, USA (*contributed talk*)
- November 2018 *Cosmology seminar*, UC Davis, CA, USA (*contributed talk*)
- July 2018 *Astronomy seminar*, Waterloo, ON, Canada (*invited talk*)
- July 2018 *CITA lunch talk*, Toronto, ON, Canada (*invited talk*)
- July 2018 *The Physics of Galaxy Scaling Relations, and the Nature of Dark Matter*, Kingston, ON, Canada (*poster*)
- May 2017 *Quantifying and Understanding the Galaxy-Halo Connection*, Santa Barbara, CA, USA (*contributed talk*)
- December 2016 *Astrodebata seminar*, Ljubljana, Slovenia (*invited talk*)
- July 2016 *Diving into the Dark: Bridging Cosmological Theory and Observation*, Cairns, Australia (*contributed talk*)
- July 2016 *From theory to applications: celebrating a century of gravitational lensing*, Leiden, The Netherlands (*contributed talk*)
- May 2016 *NAC 2016*, Nunspeet, The Netherlands (*poster*)

Key skills

Programming languages	C, python, Objective-C, julia, Swift, HTML, CSS, bash
Tools	git, matplotlib, numpy, scipy, scikit-learn, astropy, Astro-WISE, sql, (py)IRAF
Big data	Kilo-Degree Survey data, Galaxy And Mass Assembly data, EAGLE simulation data

Languages

Slovenian	Native	
English	Full professional proficiency	(IELTS – 8.0, 2013)
French	Elementary proficiency	
German	Elementary proficiency	

Publications

- First author **Dvornik, A.**, Hoekstra H., Kuijken K., et al., *KiDS+GAMA: The weak lensing calibrated stellar-to-halo mass relation of central and satellite galaxies*, 2020, A&A, 642, A83
- Dvornik, A.**, Zoutendijk B., Hoekstra H., Kuijken K., *The case for two-dimensional galaxy-galaxy lensing*, 2019, A&A, 627, A74
- Dvornik, A.**, Hoekstra H., Kuijken K., Schneider P., et al., *Unveiling Galaxy Bias via the Halo Model, KiDS and GAMA*, 2018, MNRAS, 479, 1240
- Dvornik, A.**, Cacciato M., Kuijken K., Viola M., et al., *A KiDS weak lensing analysis of assembly bias in GAMA galaxy groups*, 2017, MNRAS, 468, 3251
- Second author Mahony, C., **Dvornik, A.**, Mead, A., Heymans, C., et al., *The halo model with beyond-linear halo bias: unbiasing cosmological constraints from galaxy-galaxy lensing and clustering*, 2022, arXiv:2202.01790
- Smit, M., **Dvornik, A.**, Radovich, M., Kuijken, K., Maturi, M., Moscardini, L., Sereno, M., *AMICO galaxy clusters in KiDS-DR3: the impact of estimator statistics on the luminosity-mass scaling relation*, 2021, arXiv:2109.12009
- Bilicki, M., **Dvornik, A.**, Hoekstra, H., Wright, A. H., Chisari, N. E., et al., *Bright galaxy sample in the Kilo-Degree Survey Data Release 4. Selection, photometric redshifts, and physical properties* 2021, A&A, 653, A82
- Grootes, M. W., **Dvornik, A.**, et al, *Galaxy And Mass Assembly (GAMA): Gas Fuelling of Spiral Galaxies in the Local Universe II. – Direct Measurement of the Dependencies on Redshift and Host Halo Mass of Stellar Mass Growth in Central Disk Galaxies*, 2018, MNRAS, 477, 1015
- Contributing author Li, R., Napolitano, N. R., Spiniello, C., Tortora, C., **et al.**, *High-quality Strong Lens Candidates in the Final Kilo-Degree Survey Footprint*, 2021, ApJ, 923, 1, 16
- Ruiz-Zapatero, J., Stözlner, B., Joachimi, B., **et al.**, *Geometry versus growth. Internal consistency of the flat Λ CDM model with KiDS-1000*, 2021, A&A, 655, A11
- Schneider, P., Asgari, M., Najafi Jozani, Y., **et al.**, *Pure-mode correlation functions for cosmic shear and application to KiDS-1000*, 2021, arXiv:2110.09774
- Loureiro, A., Whittaker, L., Spurio Mancini, A., Joachimi, B., **et al.**, *KiDS & Euclid: Cosmological implications of a pseudo angular power spectrum analysis of KiDS-1000 cosmic shear tomography*, 2021, arXiv:2110.06947

Tröster, T., Mead, A. J., Heymans, C., Yan, Z., **et al.**, *Joint constraints on cosmology and the impact of baryon feedback: combining KiDS-1000 lensing with the thermal Sunyaev-Zeldovich effect from Planck and ACT*, 2021, arXiv:2109.04458

Brouwer, M. M., Oman, K. A., Valentijn, E. A., **et al.**, *The weak lensing radial acceleration relation: Constraining modified gravity and cold dark matter theories with KiDS-1000*, 2021, A&A, 650, A113

Robertson, N. C., Alonso, D., Harnois-Déraps, J., **et al.**, *Strong detection of the CMB lensing and galaxy weak lensing cross-correlation from ACT-DR4, Planck Legacy, and KiDS-1000*, 2021, A&A, 649, A146

Tröster, T., Asgari, M., Blake, C., **et al.**, *KiDS-1000 Cosmology: Constraints beyond flat Λ CDM*, 2021, A&A, 649, A88

Nakoneczny, S. J., Bilicki, M., Pollo, A., **et al.**, *Photometric selection and redshifts for quasars in the Kilo-Degree Survey Data Release 4*, 2021, A&A, 649, A81

Johnston, H., Wright, A. H., Joachimi, B., **et al.**, *Organised randomness: Learning and correcting for systematic galaxy clustering patterns in KiDS using self-organising maps*, 2021, A&A, 648, A98

Georgiou, C., Hoekstra, H., Kuijken, K., **et al.**, *Halo shapes constrained from a pure sample of central galaxies in KiDS-1000*, 2021, A&A, 647, A185

Hildebrandt, H., van den Busch, J. L., Wright, A. H., **et al.**, *KiDS-1000 catalogue: Redshift distributions and their calibration*, 2021, A&A, 647, A124

Asgari, M., Friswell, I., Yoon, M., **et al.**, *Minimizing the impact of scale-dependent galaxy bias on the joint cosmological analysis of large-scale structures*, 2021, MNRAS, 501, 3003

Heymans, C., Tröster, T., Asgari, M., **et al.**, *KiDS-1000 Cosmology: Multi-probe weak gravitational lensing and spectroscopic galaxy clustering constraints*, 2021, A&A, 646, A140

Joachimi, B., Lin, C., Asgari, M., Tröster, T., **et al.**, *KiDS-1000 methodology: Modelling and inference for joint weak gravitational lensing and spectroscopic galaxy clustering analysis*, 2021, A&A, 646, A129

Giblin, B., Heymans, C., Asgari, M., Hildebrandt, H., **et al.**, *KiDS-1000 catalogue: Weak gravitational lensing shear measurements*, 2021, A&A, 645, A105

Asgari, M., Lin, C., Joachimi, B., Giblin, B., Heymans, C., **et al.**, *KiDS-1000 cosmology: Cosmic shear constraints and comparison between two point statistics*, 2021, A&A, 645, A104

Taylor, E. N., Cluver, M. E., Duffy, A., Gurri, P., **et al.**, *GAMA+KiDS: empirical correlations between halo mass and other galaxy properties near the knee of the stellar-to-halo mass relation*, 2020, MNRAS, 499, 2896

Blake, C., Amon, A., Asgari, M., Bilicki, M., **Dvornik, A.**, *Testing gravity using galaxy-galaxy lensing and clustering amplitudes in KiDS-1000, BOSS, and 2dFLenS*, 2020, A&A, 642, A158

Georgiou, C., Chisari, N. E., Fortuna, M. C., **et al.**, *GAMA+KiDS: Alignment of galaxies in galaxy groups and its dependence on galaxy scale*, 2019, submitted to A&A

Kuijken, K., Heymans, C., **Dvornik, A.**, Hildebrandt, H., de Jong, J.T.A., Wright, A.H., **et al.**, *The fourth data release of the Kilo-Degree Survey: ugri imaging and nine-band optical-IR photometry over 1000 square degrees*, 2019, A&A, 625, A2

Petrillo, C. E., Tortora, C., Vernardos, G., Koopmans, L. V. E., Verdoes Kleijn, G., **et al.**, *LinKS: Discovering galaxy-scale strong lenses in the Kilo-Degree Survey using Convolutional Neural Networks*, 2019, MNRAS, 484, 3879

Brouwer, M. M., Demchenko V., Harnois-Déraps J., **et al.**, *Studying galaxy troughs and ridges using Weak Gravitational Lensing with the Kilo-Degree Survey*, 2018, MNRAS, 481, 5189

Brouwer, M. M., Visser, M. R., **Dvornik, A.**, et al., *First test of Verlinde's theory of emergent gravity using weak gravitational lensing measurements*, 2017, MNRAS, 466, 2547

Hildebrandt, H., Viola, M., Heymans, C., **et al.**, *KiDS-450: cosmological parameter constraints from tomographic weak gravitational lensing*, 2017, MNRAS, 465, 1454

Brouwer, M. M., Cacciato, M., **Dvornik, A.**, et al., *Dependence of GAMA galaxy halo masses on the cosmic web environment from 100 deg² of KiDS weak lensing data*, 2016, MNRAS, 462, 4451